

**Notice of Allowability**

Application No.

10/091,768

Examiner

Jeremy S. Cerullo

Applicant(s)

LAVIGNE, BRUCE E.

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Application filed on March 5, 2002.
2. ☒ The allowed claim(s) is/are 1-20.
3. ☒ The drawings filed on 08 May 2002 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some\* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

The application has been amended as follows:

Replace the title of the application with "Two-Stage Round Robin Arbitration System."

Change the phrase "that a product" in the last sentence of the abstract should apparently by "that is a product" in order to insert the missing *is*.

Change the phrase "which is coupled said second round robin arbiter" at the end of Claim 11 to "which is coupled to said second round robin arbiter" in order to insert the missing *to*.

2. The following is an examiner's statement of reasons for allowance:

3. As for Claim 1, while prior art exists that teaches portions of the subject matter of Claim 1, art has not been found that anticipates the invention as claimed in Claim 1, nor

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has art been found that renders the invention of Claim 1 obvious. For example, U.S. Patent No. 5,832,278 ("Pham") teaches a cascaded round robin request selection method in which the results of the first set of arbiters is sent to a second level arbiter (Figure 2). This teaches a hierarchical structure as claimed, but it does not teach that a first arbitration unit selects from a group of blocks of requests and that the selected block is stored and arbitrated by a second arbitration unit, nor does it teach the generation of two indexes. Also, U.S. Patent No. 5,519,837 ("Tran") teaches another hierarchical round-robin arbitration scheme in which the results of a higher-level arbiter select which of two lower-level arbiters is enabled (Figure 5). This also teaches a multilevel structure similar to what is claimed, but it does not teach that a selected block is stored and arbitrated by a second arbitration module. As another example, U.S. Patent No. 5,729,702 ("Creedon" et al.) teaches another multi-level round robin arbitration system. In Figure 2, he teaches a system that hierarchical system with two arbitration modules as claimed in the instant invention, but in his invention the grants from the second arbiter are only allowed when the first arbiter is granting to "X". Therefore Creedon does not teach that the second arbiter stores and arbitrates a block of requests selected by the first arbiter. The examiner has determined that the novel feature of Claim 1 is that the second arbitration module stores and arbitrates a block of requests that has been selected by the first arbitration module, claimed as "... a first round robin arbitration module...for... selecting a block having one or more active requests...and a second round robin arbitration module...for storing each request of

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said selected block, [and] selecting each active request of said selected block...". As this feature has not been found in prior art, Claim 1 is considered allowable.

4. The subject matter of Claims 2-8 is considered allowable based on their dependence on Claim 1.

5. As for Claim 9, while prior art exists that teaches portions of the subject matter of Claim 9, art has not been found that anticipates the invention as claimed in Claim 9, nor has art been found that renders the invention of Claim 9 obvious. For example, U.S. Patent No. 5,832,278 ("Pham") teaches a cascaded round robin request selection method in which the results of the first set of arbiters is sent to a second level arbiter (Figure 2). This teaches a hierarchical structure as claimed, but it does not teach that a first arbiter selects from a group of blocks of requests and that the selected block is arbitrated by a second arbiter, nor does it teach the generation of two indexes. Also, U.S. Patent No. 5,519,837 ("Tran") teaches another hierarchical round-robin arbitration scheme in which the results of a higher-level arbiter select which of two lower-level arbiters is enabled (Figure 5). This also teaches a multilevel structure similar to what is claimed, but it does not teach that a selected block is arbitrated by a second arbiter. As another example, U.S. Patent No. 5,729,702 ("Creedon" et al.) teaches another multi-level round robin arbitration system. In Figure 2, he teaches a system that hierarchical system with two arbiters as claimed in the instant invention, but in his invention the grants from the second arbiter are only allowed when the first arbiter is granting to "X".

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Therefore Creedon does not teach that the second arbiter arbitrates a block of requests selected by the first arbiter. The examiner has determined that the novel feature of Claim 9 is that the second arbiter arbitrates a block of requests that has been selected by the first arbiter, claimed as "...a first round robin arbiter...for... selecting a block having one or more active requests...and a second round robin arbiter...for selecting each active request of said selected block...". As this feature has not been found in prior art, Claim 9 is considered allowable.

6. The subject matter of Claims 10-15 is considered allowable based on their dependence on Claim 9.

7. As for Claim 16, while prior art exists that teaches portions of the subject matter of Claim 16, art has not been found that anticipates the invention as claimed in Claim 16, nor has art been found that renders the invention of Claim 16 obvious. For example, U.S. Patent No. 5,832,278 ("Pham") teaches a cascaded round robin request selection method in which the results of the first set of arbiters is sent to a second level arbiter (Figure 2). This teaches a hierarchical structure as claimed, but it does not teach that a first arbiter selects from a group of blocks of requests and that the selected block is stored and arbitrated by a second arbiter. Also, U.S. Patent No. 5,519,837 ("Tran") teaches another hierarchical round-robin arbitration scheme in which the results of a higher-level arbiter select which of two lower-level arbiters is enabled (Figure 5). This also teaches a multilevel structure similar to what is claimed, but it does not teach that a

selected block is stored and arbitrated by a second arbiter. As another example, U.S. Patent No. 5,729,702 ("Creedon" et al.) teaches another multi-level round robin arbitration system. In Figure 2, he teaches a system that hierarchical system with two arbiters as claimed in the instant invention, but in his invention the grants from the second arbiter are only allowed when the first arbiter is granting to "X". Therefore Creedon does not teach that the second arbiter arbitrates a block of requests selected by the first arbiter. The examiner has determined that the novel feature of Claim 11 is that the second arbitration module stores and arbitrates a block of requests that has been selected by the first arbitration module, claimed as "...selecting a particular block having one or more active requests using a first round robin arbiter;... storing each request of said particular block;... [and] selecting each active request of said particular block using a second round robin arbiter...". As this feature has not been found in prior art, Claim 16 is considered allowable.

8. The subject matter of Claims 17-20 is considered allowable based on their dependence on Claim 16.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent No. 4,511,959; U.S. Patent No. 5,680,554; U.S. Patent No. 5,930,487; U.S. Patent No. 6,157,978; U.S. Patent No. 6,311,249; U.S. Patent Application Publication No. 2004/0243752; European Patent Application Publication No. EP 0 749 072 A2; Round-robin Arbiter Design and Generation – Shin et al.; and Model Checking in an Industrial Environment – Hensel et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy S. Cerullo whose telephone number is (571) 272-3634. The examiner can normally be reached on Monday - Thursday, 7:00-4:30; Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark H. Rinehart can be reached on (571) 272-3632. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



JSC



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**PRIMARY EXAMINER**